

PRODUCTION AND EVALUATION OF INSTANT HERBAL MIX SOUP

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ABSTRACT

An instant soup with rich in micro-nutrient is demand of any country, the aim of research work is to formulate instant mix vegetable soup with natural herbs like are Basil (Tulsi), Curry, Green Coriander, Mint, and Bay leaves. These herbal formulation increases antioxidant quality of soup. The dried vegetarian soup supplemented with potato, garlic, salt beetroot, onion, coriander, black pepper, Carrot, cumin, fenugreek, tomatoes mint and basil leaves are used in combination with Finger Millet, Chick Pea & Soybean to formulate M1, M2, M3, and M4 respectively. Proximate analysis, total calories, color measurement, sensory, rheological evaluation was performed with standard conventional methods for accomplishing the norms. The result showed that enrichment with herbs in legumes significantly increases the sensory and other nutritional benefits, comparison is also quoted in results and discussion sections.

KEYWORDS: Herbal Soup, Formulation, Evaluation, Finger Millet, Chick Pea, Drying & Proximate Analysis

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INTRODUCTION

A modern lifestyle of many Indian people today, especially living in big cities, needs fast paced and practical things almost in all aspects, including preparation, processing and presentation of food. It creates a society who loves instant food products such as food that are ready to cook and ready to eat. One of the potential products that can be developed into an instant food is functional soup. For fulfilling consumer social requirements dried soups play a vital role[1]. Dehydrated food especially dry soup mixes has major advantages as, protection from oxidative spoilage, enzymatic spoilage and can have flavor stability for longer periods up to 1 year at room temperature. They are rich source of protein and have good nutritive value and they have longer life without refrigeration. Due to their lesser weight they are easy to ship and can be readily available around the clock in year[2,3,4,5]. Functional soup can become an alternative food for breakfast because it could fulfill the adequacy of energy and nutrient required by the body, very practical in preparation and taking only short time to serve. Supplemented additives and their functional attributes and their ratio are major concerns for good quality of dried soups [6]. For maintaining nutritive value whole, legumes and vegetables are added in it. Due to these needed carbohydrate, proteins, fiber and amino acids are provided [7]. Soup powders and its functional attributes provide health benefits[8]. Due to limitation of plant proteins as deficiency of amino acids, can be maintained or fulfilled by mixing legume and vegetable flours together [9,10].

BACKGROUND STUDY FOR DRYING OF HERBS AND VEGETABLES

Convective drying method is mainly used for drying of herbs and vegetables [7] Due to drying physical properties are changed such as change of texture, change of flavor, change of color, loss of nutrients etc. [9,10]. Some dried fruits and vegetables are rehydrated prior to further processing and for that purpose these fruits require

a minimal quality for adequate rehydration which is not always possible with conventional convective drying [11]. There are a number of studies that have addressed the limitations associated with convective drying. Majorly high temperature during drying process is main concern for loss of quality. Many researches are being proposed which states that the lowering the drying temperature can improve the quality of dried product [12], while in such scenarios the drying time is elongated and cost incurred becomes high which becomes unmanageable. In hot air driers the food is in contact with a moving stream of hot air. heat is supplied to the product mainly by convection. The objective of present study to prepare and evaluate proximate and sensory quality of vegetable mix herbal soup.

MATERIAL AND METHODS

All food materials like tomatoes, green peas, garlic, carrot, soybean, onion, black pepper, cumin seeds, finger millet, are obtained from local market at Yamuna Nagar Haryana India

Preprocessing of Raw Material

Vegetables were cleaned, peeled and are preprocessed before slicing into small parts and blanched in hot water as a requirement of process at 98C for at least 5 min and at most up to 8 minutes. Then they are being cooled using cold water wash.

Drying Process Used

Ingredients mentioned above after cold wash are being dried using hot air flow process. Convective drying consists of passing heated air through layers of the product. It can be conducted with tray or cabinet dryers, where perforated trays hold thin layers of materials The tray drier consists of an insulated tray containing an air circulating fan which moves the air through a heater and then through adjustable baffles which direct air between the tray of food. Initially at 68 C temperature is maintained for first four hours drying and then temperature is moderated up-to 55 C till ingredients get complete drying. [13],[18]-[24]. The highlight of this work is inclusion of herbs, chick peas, finger millet and soybean. Some preprocessing technological treatments are done on these ingredients as shown and described in Figure 1. Finger Millet is soaked for at least 6 hours. Chick peas are boiled for 30 minutes and soybean is soaked overnight for 12 hrs. Then their mixture is dried with hot air drying process, grinded and sieved for homogeneous granularity. Complete dried powder is sieved into 315 micron.

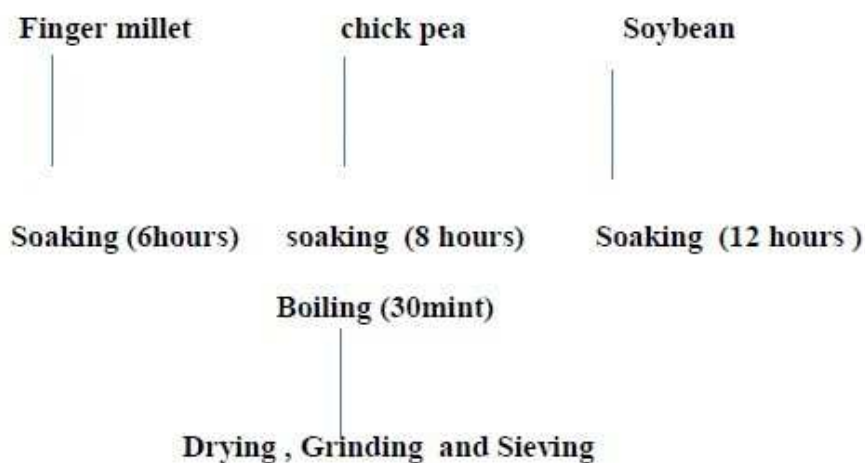


Figure 1: Some Technological Treatment before Drying

Preparing Dried Vegetarian Mix Soup

All dried powder sample of legumes flour and vegetables were seasoned with dried garlic, coriander, onion, cumin seeds, black pepper, and salt. This mixture is used to make four different dried vegetarian mix herbal soup samples named Mix1, Mix 2, Mix 3 and Mix 4 as shown below in Table 1. The resultant soup powder is kept at -20 C in polythene bags for further analysis.

Proximate Analysis

Moisture, Ash, protein, fat crude fiber content of dried vegetarian soup mixtures were determined according to AOAC [14] standards.

Table 1: Ingredients for Different Composition of Mix Vegetable Soup Powder with All the Ingredients

Ingredients	Mix 1gm (M1) Finger millet(10gm)	Mix 2 gm (M2) Chick peas (10gm)	Mix 3 gm (M3) Soy- bean(10gm)	Mix 4 gm (M4) Green peas and Soybean(10gm)
Tomato	12	14	17	18
Beetroot	4	6	8	10
Onion	5	5	5	5
Garlic	3	3	3	3
Carrot	10	8	6	4
Cabbage	5	6	7	8
Potato	10	8	6	4
Corn	8	6	5	5
Spices Power	5	5	5	5
Herbal Powder	5	5	5	5
Brown Sugar	5	5	5	5
Table Salt	3	3	3	3
Total	75	75	75	75

Calories Analysis of Vegetarian Herbal Soup

For calculating total calories of instant mix vegetable soup standard James formula [15] is used, which is given below in Equation 1.

$$\text{Total calories} = \text{fat} * 9 + \text{protein} * 4 + \text{total carbohydrate} * 4 \text{ ————— Equation 1.}$$

Rheological Properties of the Resultant Soup Samples

Brookfield manual is used for measuring viscosity and shear rate of herbal vegetable soup [16]. Sample adapter is used for sampling and for desired temperature a constant temperature water bath was used. For viscosity measurement, viscometer was used and rotated in range of 10 to 60 rpms. SC4-21 spindle was selected for the measurement of rheological properties of soup samples M1, M2, M3, and M4 and are controlled at room temperature ($25\text{C} \pm 1\text{C}$).

Sensory Evaluation of Herbal Soup Samples

Ours shortlisted soup samples are sensory evaluated for characteristics like flavor, color, appearance taste, dissolution rate etc. 10 grams of soup sample is mixed with 65 ml of water for evaluating its sensory characteristics.

Ghavidel, R.A et al method [17] was used to carry out sensory evaluation of soup sample by ten panelist, who were not alcoholic and nonsmoker. Sensory characteristics are measured using Hedonic scale. Which has total 9 grade

points from 1 to 9 and least to most preferred. A stainless steel pan was used for sample collection of soup, 0.55 grams are mixed in 100 ml Luke warm water and stir properly in 800 C for 7 minutes. For each sample panelists graded their likings on 9 hedonic scale. The scores represented the following: 1-dislike extremely, 2-dislike very much, 3-dislike moderately, 4-dislike slightly, 5-neither like nor dislike, 6-like slightly, 7-like moderately, 8-like very much and 9-like extremely, this nomenclature is used as per Ghavidel and Prakash work in 2007 (25). Then to have a composite and stable value of each characteristic, all 10 values are averaged and reported.

Statistical Analysis

Color, particle size, nutritional, functional and textural analysis was done in triplicate, and two-way analysis of variance (ANOVA) was used to estimate their statistical significance.

RESULTS AND DISCUSSIONS

Statistical analysis showed that the moisture content and water activity of vegetable mix soup are 2.5% in mix 1 and 4.7 in mix 4, according to jay, water activity below 0.6 is desirable for dried food since it retard both microbial growth and browning reaction during storage. Data on the basis of statistical analysis revealed that fat percentage of mix vegetable soup are 4 % in mix1 and 5% in mix 2 which is slightly higher than added amount of fat because of the added ingredients contributed some amount of fat. High amount of protein content of vegetable mix soup is due to added finger millet, soybean and green peas. Protein content of mix 1 is 16% and mix 4 are 15%. high amount of added herbs and vegetables give high amount of ash content, mix 1 18% and mix 2 with 17%. although the vegetable soup mix contained 11% salt during preparation and mixing get diluted up to 1.8% based on the pH value 4.7, the product can be categorized as a low acid food. though clostridium perfringens and clostridium botulinum are the problematic organism in low acid food, their growth in dried product is less likely due to low water activity.

Table 2: Chemical Composition of Instant Mix Soup

Parameters	Mix 1	Mix 2	Mix 3	Mix 4
Moisture %	2.5 ± 1.2	2.8 ± 1.6	3.5 ± 1.2	4.7 ± 1.8
Ash %	18.4 ± 0.22	17.4 ± 1.1	18.6 ± 1.2	14.6 ± 1.4
Protein %	16 ± 1.5	14 ± 1.2	6.84 ± 1.4	15 ± 1.3
Fat %	12.32 ± 1.7	8.4 ± 00	4.4 ± 1.5	5.7 ± 1.00
Fiber %	2.78 ± 1.8	2.40 ± 0.5	2.66 ± 1.8	2.93 ± 1.3
Carbohydrate %	48 ± 1.9	55 ± 0.4	64 ± 1.9	57.07 ± 1.4

Sensory evaluation results shows that color, flavor, texture and overall acceptability of mix vegetable soup are different in each sample. the color of Mix 1 sample are 5.6 which shows like slightly and mix 3 sample color with 9.5 rating which shows like extremely. The color of Mix 3 are rich in tomato and beetroot which give dark bright red color. The flavor of vegetable mix soup were based on onion garlic and herbal powder which is high in mix 3 which rating 7.8 which shows like very much. Sensory analysis of texture shows that Mix 1 has 6.8 and Mix has 8.4 which is due to presence of finger millet, green pea and soybean flour. The overall acceptability of Mix 1 is 7.8 and Mix3 is 9.5 it is due to presence of soybean and vegetable.

Statistical result of Calorie evaluation showed that the total calorie of 110-gram instant mix vegetable soup was 366.8 kcal. Which is good for one-time meal plan.

Table 3: Means of Sensory Evaluation

Sample No.	Sensory Attributes			
	Color	Flavor	Texture	Overall Acceptability
Mix 1	5.6±1.60	6.7±0.43	6.8±1.88	7.8±1.11
Mix 2	7.4±1.84	5.6±00	5.8±1.66	6.8±1.44
Mix 3	8.6±0.84	7.8±1.4	8.4±1.00	9.5±00
Mix 4	6.7±1.66	6.5±1.55	6.9±00	6.9±1.33

CONCLUSIONS

Formula diet with rich in essential nutrient is demand of present lifestyle. So vegetable mix herbal soup which is rich in millets is formulated and tested on calories, color measurement, sensory and rheological evaluation for acceptance by people. All evaluations are done with standard values, which has shown that this soup has been one of alternative source of food for all age group of people and it full fill one-time meal requirement. It could be concluded that present sample of herbal soup fulfill the needed requirements of nutrients with good taste and sensory acceptability.

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